

## A MICROCOUNTING CHAMBER

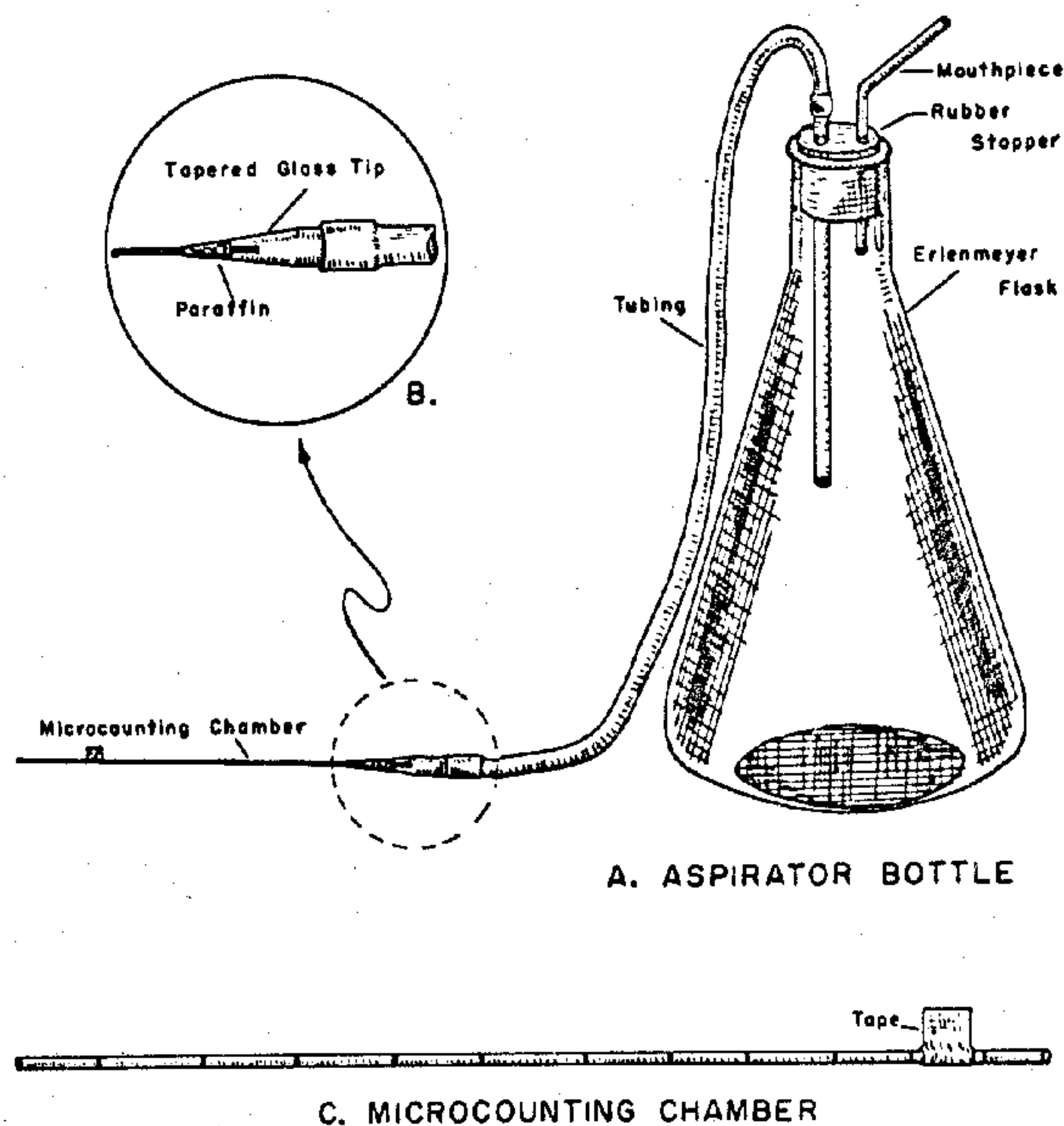
A small pipette has been devised to expedite counts of microorganisms in laboratory cultures or in samples of phytoplankton from the field. Motile or nonmotile cells of no more than  $10\mu$  in greatest dimension can be observed. Cultures dense as 40 million cells per liter, as well as individual species, can be enumerated rapidly.

Thin-walled 1/4-inch soft glass tubing about 8 inches long is drawn to form a capillary tube with a diameter as uniform as possible. An outside diameter of 0.35 to 0.50 millimeter is sufficient for counting chambers graduated into 0.001-milliliter units; a diameter of 0.5 to 0.7 millimeter is suitable for 0.01-milliliter divisions.

An aspirator bottle (A) is made by running two pieces of 1/4-inch glass tubing through a rubber stopper fitted in a 500-milliliter Erlenmeyer flask. One of these pieces, slightly bent, is used as a mouthpiece. The second, straight, is extended with about 18 inches of soft rubber tubing. Into this is fitted a glass tip (B) tapered to an opening about twice the diameter of the capillary tube. The tube to be calibrated as a counting pipette is secured to this tip by a drop of melted paraffin (applied carefully so as not to obstruct the tube's opening).

Mercury is used to establish the standard calibration of the pipette. At 20° C., the weighed quantity of mercury necessary to establish 0.01-milliliter graduations is 0.1354 gram; to establish 0.001-milliliter graduations, 0.0135 gram.

Suction is applied to the mouthpiece of the aspirator bottle to draw into the capillary tube the desired quantity of mercury. (Care must be taken not to pull the mercury into the larger bore.) A thin mark is made with acetate ink on the glass at each end of the column of mercury. The next graduation is made by adjusting the mercury column downward in the capillary till the meniscus of the column is at the previous mark. Then a new mark is put at the unmarked end of the mercury column and the procedure is repeated till the desired



"counting chambers" are standardized. The paraffin is then heated gently and the pipette taken from the holder. A little masking tape on the end of the finished pipette makes a convenient handle (C). A piece of larger glass tubing, its ends stoppered with cotton, is a useful storage case.

Capillary action fills the pipette after its tip is slightly immersed in the water. If an obstruction (as an air bubble) keeps the pipette from filling, suction by mouth will fill the chamber. During enumeration, the chamber is laid on a piece of flat, clear glass (about 4 by 8 inches), which, in turn, is laid on the microscope stage.

A wide-field stereoscopic microscope with 27X or 54X magnifications has generally been best for study of these samples. Proper illumination is essential. Use of a second microscope lamp with the beam of light directed nearly parallel to the pipette improves visibility of the area within it.

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